

Time to Get Moving: Helping Patients With Diabetes Adopt Exercise as Part of a Healthy Lifestyle

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“Exercise in the days before insulin we regarded as useful, but by no means did we appreciate it as vital in the care of diabetes We should return to it to help us in the treatment of all of our cases”

—Eliot P. Joslin, *Treatment of Diabetes Mellitus*, 1959

Eliot Joslin's appreciation for the importance of exercise in managing diabetes was visionary. In the decades since he made the observation quoted above, an impressive body of research has accumulated that demonstrates the varied benefits of regular physical activity for people with type 1 or type 2 diabetes. Notably, exercise has been shown to improve glycemic control, reduce the need for insulin and oral hypoglycemic agents, and improve body weight control. Moreover, exercise has myriad benefits for all people beyond those relating to diabetes alone. It can work wonders for the heart, improving the lipid profile, reducing risk for heart disease, restoring function after a heart attack, and moderating blood pressure. It helps in maintaining bone health regardless of age, it can significantly relieve depression and anxiety, and it appears to help maintain cognitive function in old age.¹⁻³ However, despite these and other benefits, many patients with diabetes do not include regular exercise as an integral part of their therapy.⁴

The reasons why this is true are not well understood, but certainly both patients and providers contribute to the failure of using regular exercise to improve diabetes outcomes. In surveys

asking patients why they do not engage in regular exercise, the most common reasons cited are lack of time, health-related reasons, boredom, lack of convenient exercise locations, and expense.⁵ These answers suggest that our patients' perceptions may be the greatest barrier to adopting an exercise program.

Failure to exercise may also reflect a long-term history of obesity and inactivity, which is all too common among people with type 2 diabetes. As a result, these patients are often not experienced with structured exercise and may even have had negative experiences in previous attempts to increase their level of activity. Moreover, many have tried and failed at diet programs, which often encourage increased exercise as well. Thus, they may be more resistant to suggestions to adopt a new or unfamiliar set of behaviors.

Health care providers also are not always familiar with using exercise in treating their patients with diabetes. Indeed, most providers still orient their practice behaviors to an acute-care model and have little formal training in the delivery of lifestyle modification interventions designed to support the care of chronic diseases. As a result, many providers are unsure how to best implement and integrate exercise into the diabetes therapy plan. Moreover, providers often perceive their patients as “nonadherent” when suggestions to diet and exercise do not result in weight loss between clinic visits. This can result in providers developing the belief that most type 2 diabetic patients are not capable of effective lifestyle change.

Health care professionals, however, are in a unique and influential position to motivate nonactive patients to begin and maintain an effective and safe long-term exercise program.^{6,7} This article offers suggestions for how best to accomplish this goal in the context of the clinical encounter. The foundation for these suggestions is based on four principles derived from behavior change theory:

1. Any behavior, in this case exercise, is more likely to be attempted if it is perceived as reinforcing to the person. In this context, the reason to exercise needs to be chosen by the patient rather than the provider and viewed by the patient as valuable and reinforcing.
2. Exercise is more likely to be sustained if the method chosen has few barriers to implementation. This means that it must integrate well with a patient's lifestyle, beliefs, and attitudes. Providers can help patients clarify their choices.
3. Exercise is more likely to be sustained if implementation is not associated with negative outcomes (i.e., punishment). In this regard, patients need to be educated on how to avoid the potential negative consequences of exercise, particularly those associated specifically with diabetes.
4. Exercise is more likely to be sustained if consistently reinforced by the health care team.

HELPING PATIENTS FIND A PERSONAL REASON TO EXERCISE

To help patients adopt an exercise program, it is vital that providers try to

understand the factors that shape their decision to either try or not try exercise. In this regard, three basic principles of behavior modification are worth considering.

Perceived Benefits

The first and most basic principle is that our motivation to begin any new behavior, such as a regular exercise program, is grounded in what we perceive the benefits to us will be and how important obtaining the benefits is to us. An important corollary of this principle is that what one perceives as a benefit is idiosyncratic and can change over time for the same person.

Perceived Costs

The second principle is that one is unlikely to initiate or maintain a behavior if the perceived costs associated with the activity outweigh the perceived benefits. The word “perceived” is important here. What are viewed as costs are idiosyncratic, vary widely among people, and can include physical, social, or psychological factors.

Reinforcement

The third principle reflects the balance between perceived benefits and costs. Simply stated, if a behavior, such as exercising, leads to desired benefits, the behavior is reinforced and thus is more likely to be repeated. If, on the other hand, exercise fails to gain benefit or is seen as punishing, it diminishes in value and thus is not likely to be repeated. A corollary of this principle is that reinforcement and punishment are most effective when they are applied immediately after the target behavior. The greater the delay, the weaker the motivating aspects. A second corollary is that in almost all cases, positive reinforcement paradigms are more effective in encouraging long-term behavior change than is the use of punishment.

Using these principles, providers can begin to understand why many patients with diabetes do not exercise. For example, the rationale for exercise often pre-

sented to diabetic patients is the benefit to their glycemic control, which in turn is promoted as a means of avoiding complications (i.e., punishment). This rationale is a negative reinforcement paradigm in which patients are asked to do something to prevent a negative consequence. The motivating power is diminished in that the threatened punishment often will not occur for several years.

Second, not all patients may see reducing the risk of developing complications as the most important or motivating of benefits associated with exercise. Indeed many patients, particularly those who have long histories of sedentary behavior, may view the prescription of exercise as yet another burden imposed on them by their diabetes. Moreover, they may view exercise as an unpleasant physical activity that, because of their obesity, is intrinsically difficult and possibly stressful.

Third, some patients do not have realistic expectations of the benefits and costs associated with exercise. For example, many patients believe that in order for exercise to be effective, it has to be an intensive, physically challenging activity. Others may believe that exercise will automatically result in dramatic weight loss. Clearly, research has demonstrated that there are many benefits associated with modest levels of physical activity. Although physical activity is associated with weight loss, this is only true if the exercise is of sufficient duration and intensity and conducted with some attention to diet. Whatever the reason, exercise that is viewed as a “failure” experience because it does not meet expectations is less likely to be maintained over time. This highlights the importance of helping patients set realistic and achievable goals.

HELPING PATIENTS FIND A PERSONAL VALUE FOR EXERCISE

To begin the process of motivating patients to adopt an exercise program, talk to them about their views of exercise and explore their experiences with previ-

ous efforts. Often, this discussion will reveal that patients do not view exercise in terms of health benefits. Rather, it is viewed as an unpleasant activity that has been punishing when attempted.

This may be the result of unrealistic expectations about exercise and improper education regarding how to safely conduct physical activity. The tale of the “weekend warrior” who goes from very sedentary to a sudden burst of activity and subsequently suffers the aches and pains of overexertion is all too familiar. Also, as previously noted, many people view exercise as something that requires extreme levels of exertion while wearing tight, unflattering exercise clothes. For many patients with type 2 diabetes, this image sets up a socially embarrassing scenario that acts as a barrier to attempting exercise.

To begin to address these and related issues, it is important to discuss with patients why exercise is important and how the health care team can assist them. An important first step is describing to patients the benefits of exercise for people in general and for people with diabetes in particular and what constitutes exercise to achieve these benefits. In describing health benefits, the following categories should be discussed:

1. **Health benefits**, such as improvements in glucose regulation, weight control, lipid profiles, hypertension, and increased work capacity
2. **Social benefits**, such as increased interaction with family members, “social others” (i.e., training partners), and participation in organized, community-based activities
3. **Psychological benefits**, most notably anxiety, depression, and stress reduction and increased feelings of well-being.

In addition to these benefits, it is important to also emphasize the following key points:

- **Exercise does not have to be done at Olympic levels while wearing spandex. Rather, more modest levels of activity can be quite effective.**

Ample research suggests that 30 minutes a day of moderate-intensity physical activity, such as brisk walking, performed 5 days a week will confer the majority of exercise-related benefits. Moreover, while 30 uninterrupted minutes are the ideal, three shorter, modest levels of activity will also be beneficial.

- **Exercise should be viewed as part of a lifelong management program.** Patients should not expect to begin exercising at high intensity. A good program is one that progresses through a series of stages until an effective and acceptable level is achieved. Together, providers and patients should select a series of goals that are safe, achievable, and will help develop an effective program over time.
- **Patients will have to learn how to exercise properly (i.e., to perform the activity so that they avoid discomfort, injury, and problems with their diabetes).** Proper stretching and warm up activities are important. This will require them to be willing to experiment a bit with new behaviors, including adjusting their diabetes regimen. It also means that they will have to use effective equipment, especially properly fitting shoes.
- **Patients don't have to figure out how to do all of this alone.** Health care professionals and others in their communities are there to help them accomplish these goals.
- **Selecting activities that are responsive to their personal situation is the key to patients maintaining a long-term exercise program.** Their goals and desires and the availability of time and appropriate support must be considered.

Having laid this foundation, clinicians will be ready to assist patients in selecting an exercise program that is likely to be a source of positive reinforcement and thus sustained over time.

HELPING PATIENTS SELECT THE RIGHT EXERCISE PROGRAM

An important component to increasing exercise adoption is providing patients with specific exercise prescriptions. Frequently, when patients are told to exercise by their health care providers, it is a generic prescription with little or no guidance concerning what to do or how to do it. Moreover, they are not given much guidance concerning how to adjust their diabetes regimen to exercise safely. As a result, they often ignore the recommendation or choose activities without any regard for their suitability or safety.

This can result in exercise becoming a negative event in which the costs outweigh the benefits. By discussing with patients their answers to two simple, related questions, clinicians can help them more critically consider factors that can contribute to or inhibit their selection of an exercise method that they are likely to enjoy. These two questions are:

- **What are your goals for exercise?** Finding out patients' goals makes it easier to identify the types of activities that will help achieve those goals and can point toward what types of outcomes are likely to motivate them. It is important to consider that patients' goals may parallel or be totally at odds with those of the clinician. Whatever the goals, do not be judgmental. Remember, the rationale might not reflect what the clinician feels is most important, but it may result in achieving the same end point.
- **What types of physical activity do you like to do or think you would like to try?** This question is designed to help guide patients in selecting an appropriate activity that they are motivated to do. If they do not have a strong sense for what they want, a useful strategy is to ask them to indicate their preference between the following options: *a)* long- or short-duration exercise; *b)* high- or low-intensity exercise; *c)* exercising alone or with others; *d)* exercising at home or at a facility; *e)* exercising indoors or out-

doors; and *f)* participating in a competitive or cooperative sport.

Patients' responses to these types of preference tradeoffs will help them critically consider what is truly reinforcing to them. This can also help clinicians in providing suggestions regarding the suitability of a given activity and how patients may best adapt their diabetes regimen to its demands. Try providing patients with a list of activities to stimulate their consideration of possible modes of exercise. Once patients have narrowed down the possibilities or even selected specific exercise methods, help them address the second axiom: that the exercise program must be realistic and feasible for them in order for it to be sustained. This may be done by encouraging them to consider the following questions.

How Easily Can I Engage in My Activity of Choice Where I Live?

The concept is simple: you are more likely to maintain a long-term exercise program if the exercise you choose is convenient for you to do. Many of us have a tendency to begin an exercise program, only to find that it is simply too difficult to participate in on a regular basis for a variety of reasons that we ignored, rationalized, or simply did not consider before we began. Critical questions that should be considered are:

- **Does it require special facilities?** A variety of activities can only be performed at special facilities. Are the facilities easily accessible?
- **Does it require special equipment?** Many sports require special equipment to participate or ensure safety. Is equipment available and affordable?
- **Does it require special training?** Many activities require special training to learn how to do them correctly and safely. Are training opportunities readily available, scheduled at convenient times, easy to get to, and affordable?
- **Does it require others?** Several sports require one or more additional people in order to play. Will patients

always be able to find partners when they want or need to play?

- **Is it seasonal?** Many exercise activities are seasonal. In order to maintain a regular exercise program, patients choosing these will need to have alternate activities that they enjoy in the off-season.

How Suitable Is a Specific Activity Given My Physical Attributes and Lifestyle?

If the exercise activity of interest is acceptable in terms of the above issues, encourage patients to evaluate it in terms of how easy it will be for them to do. This type of assessment is difficult and requires patients be honest with themselves. It also requires greater input from health care professionals.

It is important to make sure that individuals do not have any physical limitations that might make a given activity more likely to result in some type of physical discomfort or other threat to health. This includes poor physical conditioning and pre-existing chronic conditions.⁸

It is a good idea and a recommendation of the American College of Sports Medicine⁹ that all people with diabetes undergo a medical examination to determine whether there are any musculoskeletal/orthopedic concerns that may rule out various exercise activities. Similarly, any existing comorbidities should be identified and considered in the exercise prescription¹⁰ (Table 1).

In addition to the physical examination, a graded exercise test before beginning an exercise program is also recommended. The exercise test is not only to determine contraindications to exercise, but also to greatly facilitate the exercise prescription by establishing work capacity limits.

Can I Realistically Integrate This Activity Into My Lifestyle?

For many people, the greatest barrier to beginning an exercise program is finding the time to do it. All too often, the good intention of going to the gym

every day is derailed by competing demands. Therefore, when selecting a method of exercise, it is useful to consider whether it will fit into a patient's existing schedule or will require any special adjustments.

Do I Have a Good Support Network?

Any activity is easier to engage in when there is support and encouragement from family and friends. In this regard, patients are more likely to maintain a program if they can involve others in whatever way best suits their needs.

One method to help discuss these questions with patients is to have them fill out a brief activity profile. Clinicians can then review patients' answers and discuss with them their options. An example of an activity profile is provided as a patient information handout on p. 160 of this issue.

HELPING PATIENTS MAINTAIN THEIR MOTIVATION

After beginning an exercise program, the challenge is staying with it. Here are a few tips on helping patients maintain their motivation.

Encourage Patients to "Play Smart."

Help your patients understand that the quickest way to destroy their motivation to exercise is to either injure themselves early in their program or have a bad experience with their diabetes. Smart athletes train to avoid injuries. This involves proper stretching and warming up before they exercise. It also means using proper equipment, especially footwear. Most important, patients need to avoid the temptation to do too much too fast: a gradual buildup is essential.

It is equally important that they keep in touch with their diabetes and how their exercise affects it. In particular, they need to understand that the increased utilization of glucose during exercise can result in hypoglycemia during the activity. Moreover, depending on the duration and intensity of the exercise bout, there can be significant glucose uptake by the body after exercising that

can result in hypoglycemia several hours after exercise has been completed.

Therefore, it is important that patients know the symptoms of hypoglycemia and always carry some form of quick carbohydrate during and after exercise sessions to treat it.

Strategies for adjusting patients' diabetes regimen need to be carefully discussed and agreed on, and emphasis must be placed on the importance of frequent self-monitoring of blood glucose to learn how different adjustments and types of exercise affect glucose. One useful method to recommend is keeping a training log that includes monitoring results to help patients remember what did and did not work for them.

Encourage Patients to Set a Schedule in Advance and Stick to It.

One of the best ways to keep on track is to set an exercise schedule in advance. Habits are developed through practice. Setting a schedule will help patients avoid scheduling other conflicting activities when they should be exercising. Moreover, this helps avoid the "I'll do it later" phenomenon. A regular schedule will also help them more effectively adjust their regimen so that they better control their diabetes.

Encourage Patients to Get a Training Partner.

A training partner can help to motivate patients to stick to their schedule and can make the experience of exercising more fun. If the training partner is not a family member, counsel them to discuss their diabetes with their partner, including what to do if they experience hypoglycemia.

Encourage Patients to Set Realistic Goals.

Exercise goals need to be precisely defined and realistically attainable. It is also important that the goals be defined by exercise behavior (e.g., "walk for 30 minutes 3 times per week") rather than defined by an outcome of exercise behavior (e.g., "lose 20 pounds").

Table 1. Exercising With Diabetes Complications: Risks and Recommendations

	Retinopathy	Nephropathy	Autonomic Neuropathy	Peripheral Neuropathy
Risks	<ul style="list-style-type: none"> Elevations in blood pressure Possible retina detachment from jarring of head 	<ul style="list-style-type: none"> Marked changes in hemodynamics Marked elevations in blood pressure Presence of retinopathy likely 	<ul style="list-style-type: none"> Hypoglycemia Abnormal blood pressure response Abnormal heart rate response Impaired sympathetic/parasympathic nerves Abnormal thermoregulation (prone to dehydration) 	<ul style="list-style-type: none"> Superficial pain Impaired balance/reflexes Numbness/weakness in hands Decreased proprioception Weakness/atrophy of thigh muscles (when severe)
Recommendations	<ul style="list-style-type: none"> Use heart rate and RPE based on blood pressure response. Should not exceed 170 mmHg systolic because > 200 increases damage to retina Use low-impact activities Use submaximal exercise testing If possible, monitor blood pressure during exercise Consider stationary cycling, walking, swimming, and low-intensity rowing 	<ul style="list-style-type: none"> Include dynamic, weight-bearing, low-impact activity Use submaximal isometric or light weight lifting when blood pressure is controlled and left ventricular functioning is normal Develop specific programs for hemodialysis patients 	<ul style="list-style-type: none"> Use submaximal exercise testing Use RPE to gauge exercise intensity Use water activities, stationary cycling, or both 	<ul style="list-style-type: none"> Use RPE to monitor exercise intensity Use non-weight-bearing activities Use activities to improve balance
Precautions	<ul style="list-style-type: none"> Avoid Valsalva maneuvers Avoid lifting heavy weight, breath-holding stretches, high-intensity exercise, and strenuous upper arm exercise Exercise is contraindicated if recent photoococtulation treatment or surgery 	<ul style="list-style-type: none"> Avoid lifting heavy weight, intense aerobic activities, and Valsalva maneuvers Use cushioned shoes (gel/air) Maintain hydration 	<ul style="list-style-type: none"> Avoid high-intensity activity Avoid rapid changes in body position Avoid extremes of temperature 	<ul style="list-style-type: none"> Examine feet frequently Use proper footwear Perform gentle, pain-free stretching

RPE, rating of perceived exertion

Encourage patients to set a series of smaller, step-wise goals for which they can observe success and progress.

Encourage Patients to Select Self-Rewards.

Progressive rewards for attaining exercise goals help create a more positive reinforcement paradigm that can aid in increasing patients' motivation to stay with the exercise program.

Help Patients Identify Alternative Exercise Activities to Reduce Boredom.

For some people, having a set routine is the best strategy for exercise adherence.

For others, however, the same activity may eventually become boring, leading to decreased motivation to exercise. Such individuals should cross-train (i.e., identify several activities they can alternate to remain active). The goal, after all, is to do some form of exercise.

Explain the Difference Between "Failure" and "Backsliding."

Some people set themselves up for failure by ignoring their successes—the "I'm not doing well enough" syndrome. Any deviation from a schedule or failure to meet expectations is viewed as failure. It is important to point out to patients that they should understand and

accept that they will have off days in any long-term exercise program. When they do, it is not because they are a failure. They are simply having an off day.

Even the most dedicated, world-class athletes have off days. When patients do have off days, reinforce that they are experiencing a temporary backslide and that they will get on track as soon as they can. Remind them to tackle the future, not to haggle over the past.

Reinforce Patients' Efforts at Each Clinic Visit.

Increasing evidence suggests that health care providers can play an instrumental role in getting patents to initiate exercise

by both avidly recommending it and systematically reinforcing its importance at each clinic visit.^{2,6} Asking patients about their activity and praising them for any effort can often result in increased effort.

CONCLUSION

Helping patients with diabetes incorporate exercise into their daily routine is a significant challenge. This article provides some guidelines that can help in this process. Clinicians will no doubt experience periodic frustration with patients' lack of success. In such cases, clinicians should take a deep breath and relax. Directing such frustration toward patients will not help. Instead, team up with patients by asking them how you might help solve the problem. This will not only help patients get back on track, but also enhance the overall provider-patient relationship.

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